

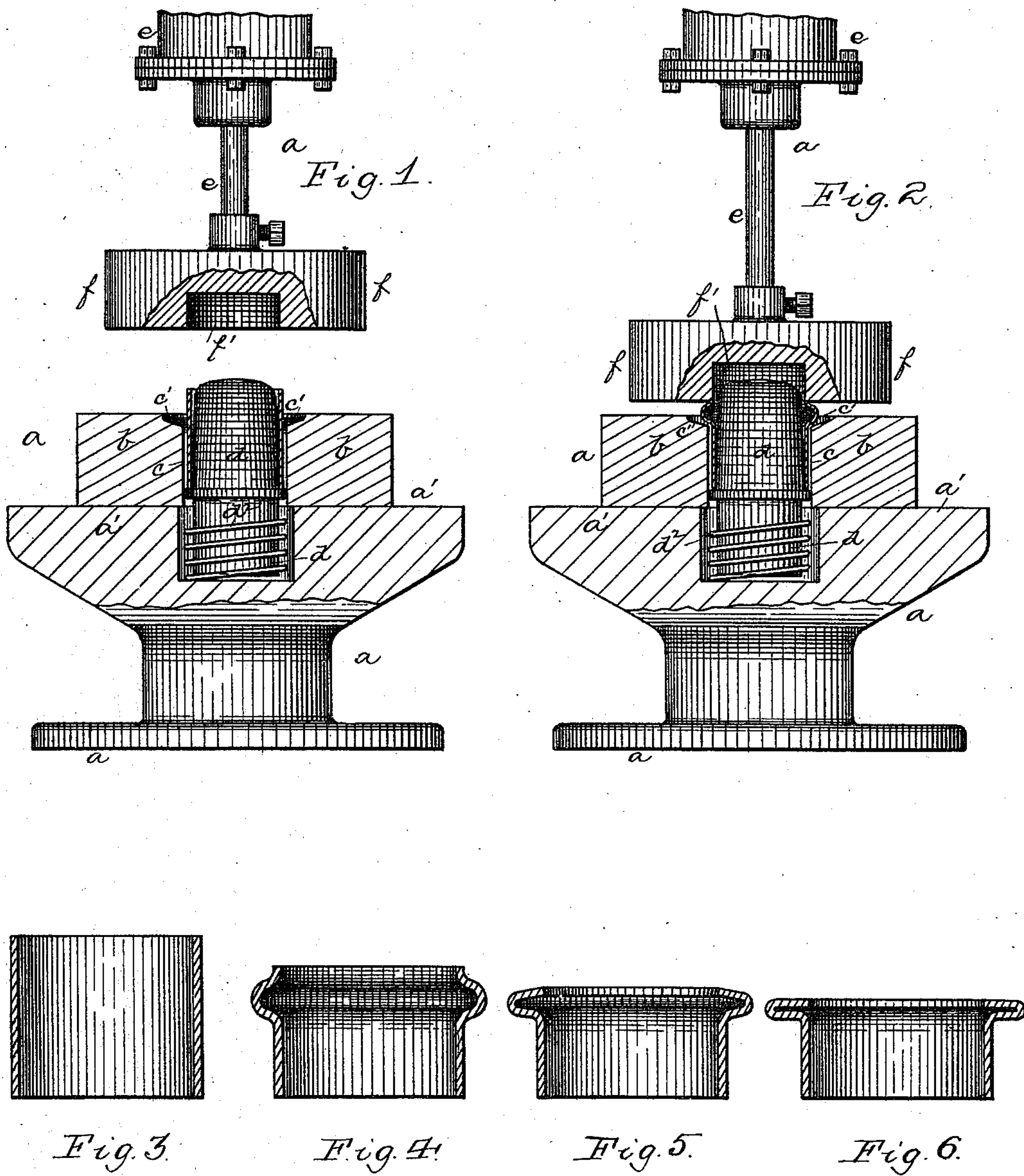
(No Model.)

J. J. ISHERWOOD.

METHOD OF MAKING COLLARS FOR AXLES AND SKEINS.

No. 412,389.

Patented Oct. 8, 1889.



Witnesses:

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# UNITED STATES PATENT OFFICE.

JOHN J. ISHERWOOD, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR TO WILLIAM F. PATTERSON, OF SAME PLACE.

## METHOD OF MAKING COLLARS FOR AXLES AND SKEINS.

SPECIFICATION forming part of Letters Patent No. 412,389, dated October 8, 1889.

Application filed February 25, 1889. Serial No. 301,120. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN J. ISHERWOOD, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Methods of Making Collars for Axles and Skeins; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a method of forming collars for axles and axle-skeins, its object being to provide a neat and durable collar at but little expense. Heretofore in forming these collars upon skeins it has been customary where cast-iron is employed to cast the collars integral with the body of the skein; or where skeins or axles are constructed of wrought metal a welded ring of the same material is placed around the skein or axle while at a high temperature, and on cooling is securely shrunk thereon; but this form of collar is crude and rough in appearance and greatly detracts from the appearance of the finished skein or axle, while the time and labor necessary to finish off the collar after it has been placed upon the skein or axle adds much to the expense thereof. Malleable cast-iron collars have also been employed, but they are not so strong or durable as those made of wrought metal. In the manufacture of skeins or axles from wrought-iron or steel tubing the tubing is first cut to suitable lengths, according to the size of the article to be made, and after such cutting operation there always remains a quantity of small pieces of tubing or short ends not long enough to be of any use, which have hitherto been disposed of as scrap. I propose, therefore, to make use of these small pieces or short ends of tubing by forming from them neat and durable collars, which may be shrunk upon the skeins or axles without the necessity of welding.

To these ends my invention consists, generally stated, in forming these flanged collars for axles and skeins and other purposes by first swaging or compressing a tubular blank longitudinally, and so forming an annular swelled portion thereof, and then compressing and flattening said swelled portion and forcing its faces against each other to form a flange extending out from the blank.

To enable others skilled in the art to practice my invention I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of a swaging-machine. Fig. 2 shows the swaging-machine lowered. Fig. 3 is a view of a piece before it is swaged. Figs. 4 and 5 show different stages of the swaging, and Fig. 6 shows the finished collar.

Like letters of reference indicate like parts in each.

In carrying out my invention I employ any suitable swaging apparatus, that shown in Fig. 1 of the drawings being well adapted for the purpose. In this apparatus *a* is the base, secured firmly in position, and upon said base *a* rests the die *b*, having the annular seat or recess *c* therein, said seat being slightly outwardly flaring at its mouth, as at *c'*. Within the seat *c* is the circular mandrel *d*, adapted to fit within said seat and having the shoulder *d'* thereon, upon which the tubing may rest when inserted upon the mandrel. The mandrel *d* tapers slightly toward the top and extends up beyond the surface of the die *b*, while around the lower end of said mandrel is the coiled spring *d<sup>2</sup>*, for the purpose hereinafter set forth. Directly above the base-block *a* is the plunger *e*, with proper connections for raising and lowering the same, while removably secured to said plunger *e* is the forming-die *f*, which has an annular seat *f'* therein corresponding in size to the mandrel *d*, and into which said mandrel is adapted to enter when the die *f* is lowered. Any size of a die may be secured to the plunger, according to the size of the collar to be made.

In forming a collar according to my improved method a piece of tubing of suitable length is heated to a high temperature and placed around the mandrel *d*, fitting closely around the same and resting on the shoulder *d'*. A die *f*, having a seat corresponding in size to the mandrel, is then dropped or forced against the blank, and as said die descends the mandrel enters the seat *f'*, while at the same time the surface of the die *f* around the seat *f'* strikes upon the upper edge of the tubing, and on account of the



tapering of the mandrel the tube is swaged or compressed longitudinally, so as to spread the part thereof which is unsupported, forming the swelled portion *g* near the top thereof, as shown in Fig. 4. The plunger is then raised and again lowered, which causes the portion *g* in Fig. 4 to be compressed, as in Fig. 5, and another blow from the die *f* causes the portion *g* to conform to the shape of the outwardly-flaring mouth *c'* of the seat *c*, which has the effect of forming a collar with a neat flange thereon, as shown in Fig. 6. As the collar is by this operation driven tightly upon the mandrel *d*, it may be easily released by striking a blow upon the top of the mandrel, which will cause a jar, owing to the coiled spring *d'*, sufficient to release the collar, whence it may be readily removed. These dies and mandrel may be quickly changed, according to the size of the collars to be formed, so that one swaging apparatus can be employed for any size of pipe by simply changing the dies and mandrel. This method enables me to furnish a neat, durable, and inexpensive collar which can be formed from what has heretofore been regarded as scrap and from odd lengths of tubing, which may be purchased from the tube manufacturers at a lower figure than regular lengths, so that the cost is greatly reduced. As I thus pro-

vide for the utilization of the scrap ends of the tubing, that employed for forming axles or skeins can be purchased when of the ordinary lengths instead of the special lengths necessary for the purpose, and can therefore be purchased at lower prices and the cost of the articles reduced. My invention may also be employed in forming flanges upon collars for other purposes, and upon other tubular and like articles where it may be used to advantage.

What I claim as my invention, and desire to secure by Letters Patent, is—

The herein-described process of forming flanged collars for axles and axle-skeins and other purposes, consisting in first swaging or compressing a tubular blank open at both ends longitudinally and so forming an annular swelled portion at one end thereon, and then compressing and flattening said swelled portion and forcing its faces against each other to form a flange on the blank, substantially as set forth.

In testimony whereof I, the said JOHN J. ISHERWOOD, have hereunto set my hand.

JOHN J. ISHERWOOD.

Witnesses:

ROBT. D. TOTTEN,  
J. N. COOKE.